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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
BROWN, VERNAL U	
ART UNIT	**PAPER NUMBER**
2635	

DATE MAILED: 01/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/625,802	DALLY ET AL.	
	Examiner	Art Unit	
	Vernal U Brown	2635	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 December 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 3-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This action is responsive to communication filed on December 15, 2004.

Response to Amendment

The examiner acknowledges the amendment of claims 1, 13, and 21.

Response to Arguments

Applicant's arguments filed 10/08/04 have been fully considered but they are not persuasive.

Regarding applicant arguments regarding each crosspoint containing an amplifier, the reference of Mu et al. teaches each crosspoint circuit (figure 6) in the crossbar switch includes an amplifier (480) which is used to couple the data input path to the data output path (col. 7 lines 19-23).

Regarding applicant's argument Mu et al. teaches receiving and outputting full swing voltages, the reference of Mu et al. teaches a crossbar switch having plurality of input and output buses (figure 1) and further teaches reducing the voltage swing of the buses of the crosspoint circuitry (col. 10 lines 28-36) and the buses at the interface of crosspoint switch is driven at full swing (col. 12 lines 5-8). The reference of Sherman is however relied upon for teaching driving a crosspoint bus at low swing voltage (col. 10 lines 18-23) as a means of reducing the voltage swing on the busses.

Regarding applicant's argument regarding the reference of Krishnamurthy, the reference of Krishnamurthy is relied upon for teaching the conventional use of low swing drivers to drive low swing busses (col. 5 lines 35-40).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 13 is rejected under 35 U.S.C. 102(e) as being anticipated by Sherman U.S Patent 6141765.

Regarding claim 13, Sherman teaches a method of connecting signals from a plurality of input buses to a plurality of output buses (the input buses and output buses including high speed bus 36 are shown connected to the controller 62 in figure 2).

The method of connecting signals from a plurality of input buses to a plurality of output buses comprising:

driving signals on the input buses (36) with a low swing and driving signals on the output buses (36) at low swing (col. 10 lines 18-23). Sherman teaches crosspoint (62) between the input and output buses (col. 5 lines 1-4, col. 14 lines 44-45) and also teaches a controller which detect (sense) the bus signal (col. 14 lines 46-50).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1and 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mu et al. U.S Patent 6490213 in view of Sherman U.S Patent 6141765.

Regarding claim 1, Mu et al. teaches a crossbar switch having plurality of input and output buses (figure 1) and further teaches reducing the voltage swing of the buses of the crosspoint circuitry (col. 10 lines 28-36) in order to increase the system performance by having immunity from common mode noise and allowing lower swing voltages to be used (col. 5 lines 25-30). Mu et al. also teaches the crosspoint switch comprises an amplifiers (col. 10 line 45). Mu et al. is however silent on teaching driving the buses at the interface of the crosspoint switch at low swing. Sherman teaches bus having a crossbar structure (col. 5 lines 1-3, col. 14 lines 44-45) connected to a crossbar switch (62) having plural input and outputs (figure 2). Sherman teaches the port of the buses (inputs and outputs) are driven at low swing voltages (col. 10 lines 18-25).

It would have been obvious to one of ordinary skill in the art to drive the buses at low swing in Mu et al. as evidenced by Sherman because Mu et al. teaches lowering the voltage swing on the busses of a crossbar switch circuitry in order to increase the system performance by having immunity from common mode noise and allowing lower swing voltages to be used and Sherman teaches driving a crossbar bus at low voltage swing.

Regarding claim 8, Mu et al. teaches the crosspoint switch comprises an amplifiers (col. 10 line 45) and the amplifier is clocked (col. 13 lines 24-26).

Regarding claim 9, Mu et al. teaches the signal on the input and output busses are differential signals (col. 10 lines 30-31).

Claims 3-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mu et al. U.S Patent 6490213 in view of Sherman U.S Patent 6141765 and further in view of Krishnamurthy et al. U.S Patent 6181166.

Regarding claim 3, Mu et al. in view of Sherman teaches driving the busses of a crossbar switch at low voltage (see response to claim 1) but is not explicit in teaching the use of low swing drivers. One skilled in art recognizes that when signal needs to be transmitted over a distance a driver is used to receives the digital logic input, adds energy, and produce a current significant to transmit the signal and the use of low swing driver to drive a bus at low swing is further evidenced by Krishnamurthy et al. (col. 5 lines 35-40).

It would have been obvious to one of ordinary skill in the art to use low swing drivers to drive the busses of the crossbar switch at low swing in Mu et al. in view of Sherman as evidenced by Krishnamurthy et al. because Mu et al. in view of Sherman suggests driving the buses of a crosspont switch at low swing and one skilled in art recognizes that when signal needs to be transmitted over a distance a driver is used to receives the digital logic input, adds energy, and produce a current significant to transmit the signal and the use of low swing driver to drive a bus at low swing is further evidenced by Krishnamurthy et al.

Regarding claim 4, Mu et al. teaches a clocked regenerative amplifier (col. 13 lines 24-27).

Regarding claim 5, Mu et al. teaches an arbitration unit which determines when the source data from multiple sources is to be placed on the destination bus (col. 7 lines 7-12) and is therefore considered a timing circuit. Mu et al. further teaches the arbitration (timing) circuit includes a clock input (col. 6 lines 60-61).

Regarding claim 6, Mu et al. teaches the signal on the input and output busses are differential signals (col. 10 lines 30-31).

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mu et al. U.S Patent 6490213 in view of Sherman U.S Patent 6141765 in view of Krishnamurthy et al. U.S Patent 6181166 and further in view of Lukes et al. U.S Patent 6218901.

Regarding claim 7, Mu et al. in view of Sherman in view of Krishnamurthy et al. teaches the signal on the input and output busses are differential signals (col. 10 lines 30-31) but is silent on teaching drivers with push-pull driver circuits driving a pair of differential lines. Luke et al. in an art related High Speed Differential Output Driver invention teaches push-pull driver circuits driving a pair of differential lines (col. 1 lines 65-66).

It would have been obvious to one of ordinary skill in the art to have with push-pull driver circuits driving a pair of differential lines in Mu et al. in view of Sherman in view of Krishnamurthy et al. as evidenced by Lukes et al. because Mu et al. in view of

Sherman in view of Krishnamurthy et al. suggests a crosspoint switch having low swing differential drivers and Luke et al. teaches push pull drivers driving differential signals in order to increase bus performance and to reduce the power requirement of the circuitry.

Claims 10-12 and 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mu et al. U.S Patent 6490213 in view of Sherman U.S Patent 6141765 in view of Karp U.S Patent 5469154 and further in view of Krishnamurthy et al. U.S Patent 6181166.

Regarding claims 10 and 20-21, Mu et al. teaches a crosspoint switch comprising:
a plurality of input and output buses (figure 1);
a plurality of low swing drivers which drive signals to the input buses,
a plurality of crosspoints, each selectively passing a signal from an input
bus to an output bus (col. 9 lines 2-15);
a plurality of output amplifiers which sense the signals on the output buses (col. 12 lines 45-48). Mu et al. is however silent on teaching each crosspoint comprising an amplifier which amplifies a signal on an input bus and a low swing driver which drives a low swing signal on an output bus. Karp in an art related switching network invention teaches crossbar switches (col. 2 lines 41-42) having amplifiers in the input and output stage of the crossbar switch (figure 1) but is also silent on teaching low swing driver which drives a low swing signal on an output bus. One skilled in art recognizes that when signal needs to be transmitted over a distance a driver is used to receives the digital logic input, adds energy, and produce a current significant to transmit the signal and the use of low swing driver to drive a bus at low swing is further evidenced by Krishnamurthy et al. (col. 5 lines 35-40).

It would have been obvious to one of ordinary skill in the art to have an amplifier which amplifies a signal on an input bus and a low swing driver which drives a low swing signal on an output bus in Mu et al. as evidenced by Karp in view of Krishnamurthy et al. because Mu et al. suggests driving the busses of a crossbar at low swing and Karp teaches the use of amplifiers on the input and output busses. One skilled in art recognizes that when signal needs to be transmitted over a distance a driver is used to receives the digital logic input, adds energy, and produce a current significant to transmit the signal and the use of low swing driver to drive a bus at low swing is further evidenced by Krishnamurthy et al.

Regarding claim 11, Mu et al. teaches an arbitration unit which determines when the source data from multiple sources is to be placed on the destination bus (col. 7 lines 7-12) and is therefore considered a timing circuit. Mu et al. further teaches the arbitration (timing) circuit includes a clock input (col. 6 lines 60-61).

Regarding claim 12, Mu et al. teaches the crosspoint switch comprises an amplifiers (col. 10 line 45) and the amplifier is clocked (col. 13 lines 24-26). The amplifier is therefore considered clock regenerative.

Claims 13-16 and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sherman U.S Patent 6141765 in view of Mu et al. U.S Patent 6490213.

Regarding claim 13, Sherman teaches a method of connecting signals from a plurality of input buses to a plurality of output buses (the input buses and output buses including high speed bus 36 are shown connected to the controller 62 in figure 2).

The method of connecting signals from a plurality of input buses to a plurality of output buses comprising:

driving signals on the input buses (36) with a low swing and driving signals on the output buses (36) at low swing (col. 10 lines 18-23). Sherman teaches crosspoint (62) between the input and output buses (col. 5 lines 1-4, col. 14 lines 44-45) and also teaches a controller which detect (sense) the bus signal (col. 14 lines 46-50). Sherman is however silent on teaching the crosspoint between the input and output busses amplifies the signal. Mu et al. in an art related Crossbar switch teaches a crossbar in which an amplifier (480) is used in each crosspoint (figure 6) in order to sense the signal.

It would have been obvious to one of ordinary skill in the art to use an amplifier in each crosspoint in Sherman as evidenced by Mu et al. because Sherman suggests crossbar switch having a plurality of input and output busses and Mu et al. teaches a crossbar in which an amplifier is used in each crosspoint (figure 6) in order to sense the signal.

Regarding claims 14 and 18, Sherman teaches a crossbar switch having a plurality of input and output busses (figure 1) but is silent on teaching sensing the signal with a clocked regenerative amplifier. Mu et al. in an art related Crossbar switch teaches the sensing of the signal on the buses using a clocked amplifier (col. 13 lines 24-26).

It would have been obvious to one of ordinary skill in the art to sensed the signal with a clocked regenerative amplifier in Sherman as evidenced by Mu et al. because Sherman suggests crossbar switch having a plurality of input and output busses and Mu et

al. teaches sensing the signal on the bus of a crossbar switch with a clocked regenerative amplifier.

Regaring claim 15, Sherman teaches using a timing circuit (236) of figure 17 to control the timing of the cross point and minimizing the latency of the data signal. Sherman further teaches the data source transmitting the data transmits a strobe signal along with the data signal to the receiving module (col. 10 lines 34-42) which cause the timing to vary in a manner similar to the timing in the driving circuit.

Regarding claims 16 and 19, Sherman teaches a crossbar switch having a plurality of input and output busses (figure 1) but is silent on teaching the signals on the input busses and the output busses are differential signals. Mu et al. in an art related Crossbar switch teaches the signal on the input and output busses are differential signals (col. 10 lines 30-31).

It would have been obvious to one of ordinary skill in the art to sensed the signal with a clocked regenerative amplifier in Sherman as evidenced by Mu et al. because Sherman suggests crossbar switch having a plurality of input and output busses and Mu et al. teaches a crossbar switch having input and output busses with differential signals in order to reliable detect voltage swing.

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sherman U.S Patent 6141765 in view of Mu et al. U.S Patent 6490213 and further in view of Lukes et al. U.S Patent 6218901.

Regarding claim 17, Sherman in view of Mu et al. teaches the signal on the input and output busses are differential signals (col. 10 lines 30-31, U.S Patent 6490213) but is

silent on teaching drivers with push-pull driver circuits driving a pair of differential lines. Lukes et al. in an art related High Speed Differential Output Driver invention teaches push-pull driver circuits driving a pair of differential lines (col. 1 lines 65-66) with one line driven high while the other is pulled low (figure 1).

It would have been obvious to one of ordinary skill in the art to have with push-pull driver circuits driving a pair of differential lines in Sherman in view of Mu et al. as evidenced by Lukes et al. because Sherman in view of Mu et al. suggests a crosspoint switch having low swing differential drivers and Lukes et al. teaches push pull drivers driving differential signals in order to increase bus performance and to reduce the power requirement of the circuitry.

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mu et al. U.S Patent 6490213 in view of Sherman U.S Patent 6141765 and further in view of Fletcher U.S Patent 6392466.

Regarding claim 22, Mu et al. in view of Sherman teaches input buses and output buses with differential data lines (col. 10 lines 30-31, U.S Patent 6490213) but is silent on teaching the data lines comprises precharge circuits that share charge between the data lines to a midpoint of voltage swing. One skilled in the art recognizes that it is conventional practice to have precharge circuits at a particular voltage that share charge between data as evidenced by Fletcher (col. 2 lines 19-35) in order to improve the delay characteristics of the data lines.

It would have been obvious to one of ordinary skill in the art for the data lines to comprise precharge circuits that share charge between the data lines to a midpoint of

voltage swing in Mu et al. in view of Sherman as evidenced by Fletcher because Mu et al. in view of Sherman suggests input buses and output buses with differential data lines and one skilled in the art recognizes that it is conventional practice to have precharge circuits at a particular voltage that share charge between data as evidenced by Fletcher in order to improve the delay characteristics of the data lines.

Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sherman U.S Patent 6141765 in view of Mu et al. U.S Patent 6490213 and further in view of Fletcher U.S Patent 6392466.

Regarding claim 23, Sherman in view of Mu et al. teaches input buses and output buses with differential data lines (col. 10 lines 30-31, U.S Patent 6490213) but is silent on teaching the data lines comprises precharge circuits that share charge between the data lines to a midpoint of voltage swing. One skilled in the art recognizes that it is conventional practice to have precharge circuits at a particular voltage that share charge between data as evidenced by Fletcher (col. 2 lines 19-35) in order to improve the delay characteristics of the data lines.

It would have been obvious to one of ordinary skill in the art for the data lines to comprise precharge circuits that share charge between the data lines to a midpoint of voltage swing in Sherman in view of Mu et al. as evidenced by Fletcher because Sherman in view of Mu et al. suggests input buses and output buses with differential data lines and one skilled in the art recognizes that it is conventional practice to have precharge circuits at a particular voltage that share charge between data as evidenced by Fletcher in order to improve the delay characteristics of the data lines.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vernal U Brown whose telephone number is 571-272-3060. The examiner can normally be reached on 8:30-7:00 Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Horabik can be reached on 571-272-3068. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Vernal Brown
January 6, 2005

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